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Claims

1. (Currently Amended) A superconducting magnet system comprising:
 - (A) a superconducting magnet and a cryogenic shield for providing cooling to the superconducting magnet;
 - (B) a cryocooler positioned to provide refrigeration to the cryogenic shield;
 - (C) a cryogen vessel containing liquid cryogen; and
 - (D) a heat pipe extending from the cryogen vessel to the cryogenic shield, the heat pipe having a wall structure allowing the liquid cryogen to wick from the cryogen vessel to the cryogenic shield.
2. (Original) The superconducting magnet system of claim 1 wherein the superconducting magnet is immersed in liquid helium.
3. (Original) The superconducting magnet system of claim 1 wherein the cryogenic shield comprises a plurality of layers, including an innermost layer closest to the superconducting magnet and an outermost layer furthest from the superconducting magnet.
4. (Original) The superconducting magnet system of claim 3 wherein the cryogenic shield comprises three layers.
5. (Original) The superconducting magnet system of claim 3 wherein the cryocooler is positioned to provide cooling to each of the layers of the cryogenic shield.
6. (Original) The superconducting magnet system of claim 3 wherein the heat pipe extends to the outermost layer of the cryogenic shield.

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7. (Original) The superconducting magnet system of claim 1 further comprising means for providing refrigeration from the cryocooler to the cryogen vessel.

8. (Original) The superconducting magnet system of claim 7 wherein the means for providing refrigeration from the cryocooler to the cryogen vessel comprises a bus bar.

9. (Original) The superconducting magnet system of claim 1 wherein the heat pipe is in fluid communication with the cryogen vessel.

10. (Original) The superconducting magnet system of claim 1 wherein the heat pipe includes an upper heat exchange surface which is in direct heat exchange relation with the cryogen vessel.